

# Two new species of *Eucryphia* Cav. (Cunoniaceae) from Queensland

Paul I. Forster & B.P.M. Hyland

## Summary

Forster, P.I. & Hyland, B.P.M. (1997). Two new species of *Eucryphia* Cav. (Cunoniaceae) from Queensland. *Austrobaileya* 4(4): 589–596. *Eucryphia jinksii* P.I. Forst. and *E. wilkiei* B. Hyland are newly described and illustrated. Notes are provided on their affinities, distribution, habitats and conservation status. A key to the Australian species of *Eucryphia* is provided.

Keywords: Queensland - Cunoniaceae; *Eucryphia jinksii*; *Eucryphia wilkiei*.

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## Introduction

The genus *Eucryphia* Cav. occurs in Australia and Chile (Bausch 1938; Dress 1956; Barnsley 1983) and has been included in its own family Eucryphiaceae (Cronquist 1981; Thorne 1983; Takhtajan 1987) or in Cunoniaceae (Hufford & Dickison 1992) as is supported herein. Five species of *Eucryphia* have been recognised previously with two endemic to Chile and three endemic to Australia (Bausch 1938; Dress 1956). The three Australian species are temperate in their distribution with *E. moorei* F. Muell. occurring in southern New South Wales and Victoria (Harden 1991) and *E. milliganii* Hook. f. and *E. lucida* (Labill.) Baill. restricted to Tasmania (Curtis 1956).

Nearly twenty-five years ago, a fourth species of *Eucryphia* was discovered in north-east Queensland by Jack Wilkie. This species has been alluded to or recorded in the literature for some time (e.g. Harden 1991; Hyland et al. 1994; Jessup 1994) but has remained undescribed despite adequate fertile material in various Australian herbaria. In 1994, a fifth species of *Eucryphia* was discovered in south-east Queensland by David Jinks. This fifth species was subsequently collected in flower and fruit in early 1995. Both of these species are described as new in the current paper.

The formal recognition of these two species alters considerably the geographical distribution of the genus. *Eucryphia* has previously been considered a typical element of the southern temperate rainforest flora of Australia (e.g. Bausch 1938; Helman 1987; Jarman et al. 1987) and Chile (Bausch 1938), but now is shown to occur in subtropical and tropical areas as well. Albeit both *E. jinksii* and *E. wilkiei* occur in locations where the community types and the flora composing them experience weather patterns somewhat similar to those in southern temperate Australia. These communities show strong floristic linkages to the southern temperate assemblages and are structurally similar (Webb & Tracey 1981). Such communities were undoubtedly more widespread throughout Australia in times gone by. Pollen identified as belonging to *Eucryphia* has been identified from Oligocene (37–23.5 Ma) deposits (Hill & Macphail 1983). Fossil leaves from Tertiary deposits in south-eastern Australia have been described and named as *E. falcata* R.S. Hill, *E. microstoma* R.S. Hill and *E. aberensis* R.S. Hill (Hill 1991). Both of these living, new species of *Eucryphia* should be regarded as relict taxa that are persisting in narrow ecological niches in otherwise unsuitable climatic zones.

## Materials and methods

This paper is based on herbarium holdings at BRI and QRS and field examination of *E. jinksii*. Descriptions have been compiled from dried and spirit-preserved material.

## Taxonomy

***Eucryphia wilkiei*** B. Hyland *sp. nov.*, affinis *E. moorei* F. Muell. a qua stipulis lanceolatis (non ovatis) longioribus (4–5.5 mm contra 2.5–3 mm), foliolis venis lateralibus in parvibus paucioribus (12–20 contra 22–25) et marginibus recurvatis (non planis) ornatis differt. **Typus:** Queensland. COOK DISTRICT: southeastern slopes of Mt Bartle Frere, Jan 1970, *J. Wilkie* s.n. (holo: QRS; iso: BRI distribuendi).

*Eucryphia* sp. (Mt Bartle Frere M. Godwin C1158) (Hyland et al. 1994; Jessup 1994).

Shrub 3–4 m tall, with a dense rounded crown; indumentum of simple ginger-coloured hairs. Twigs villous, glabrescent, never resinous. Stipules lanceolate, acuminate at the apex, 4–5.5 mm long, 2.5–3 mm wide, connate, caducous, with a longitudinal strigose band on the median abaxial surface. Leaves opposite, simple, bifoliate or trifoliate, rarely 5-foliate; petioles 0.3–5 mm long, 0.5–1 mm wide, villous; lamina/leaflets elliptic-oblong to lanceolate-oblong, 19–43 mm long, 3–12 mm wide, sericeous when young becoming glabrescent on both surfaces, base attenuate, apex acute and mucronate; margins slightly recurved; midrib slightly depressed on the upper surface; main lateral veins 12–20 pairs at an angle of 60–80° to the midrib, distinct on the glaucous underside, but obscured by the fine reticulate veins on the dark glossy green upper surface. Flowers axillary; peduncles 2–3 mm long, with dense indumentum; bracts 4 or 5, imbricate, orbicular or reniform, 3–4 mm long, 3–5 mm wide, ciliate on margins, sericeous on both the inner and outer surfaces, with outermost pair of bracts persisting to the early fruiting stage and more densely pubescent on the keel area, brown; pedicels short at bud stage but elongating to 6–10 mm long at anthesis and c. 15 mm at the fruiting stage, ± glabrescent at fruiting stage; sepals 4, imbricate, decussate, lanceolate, 8–9

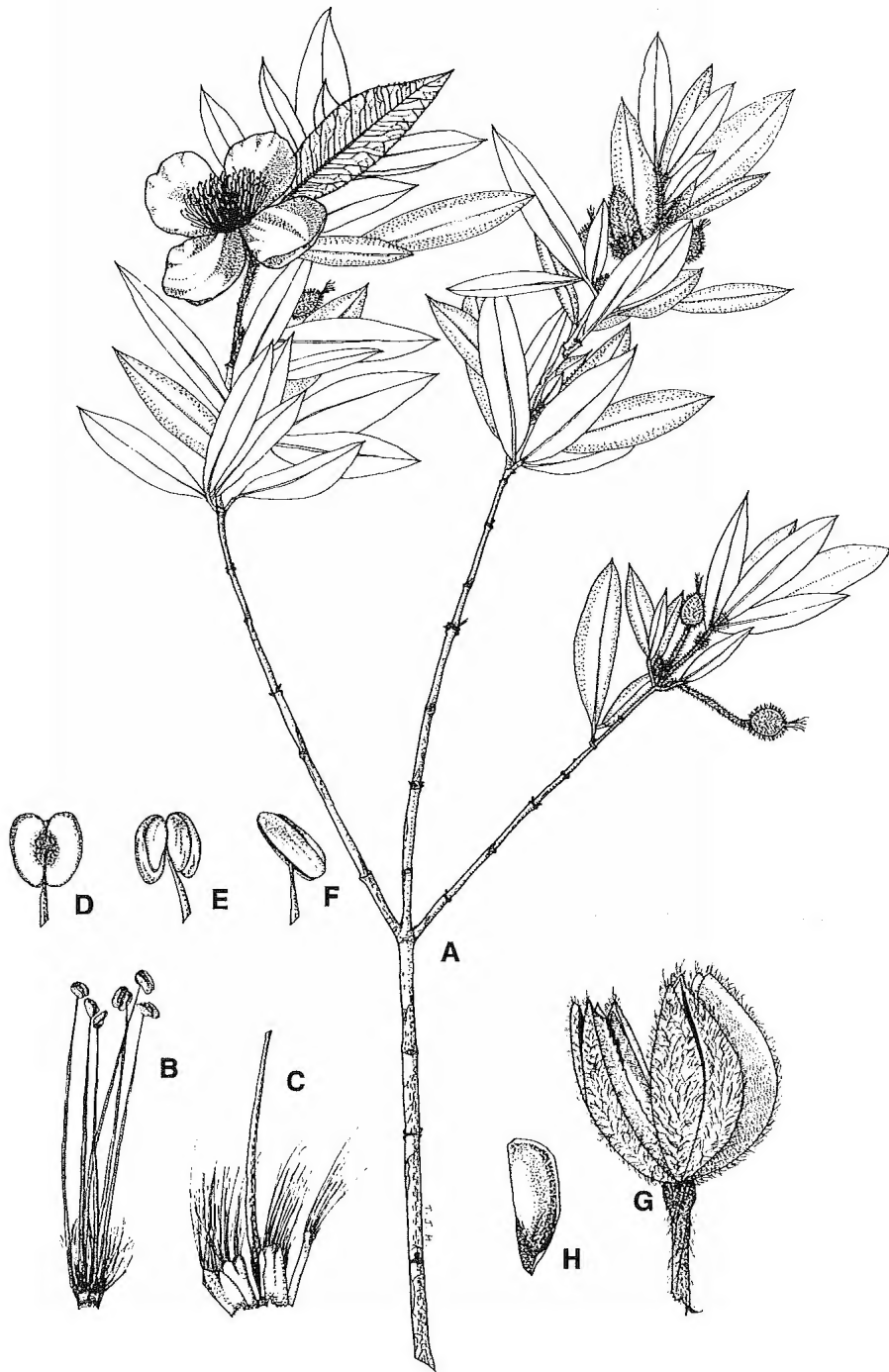
mm long, 4–5 mm wide, the outermost pair with dense woolly indumentum on outer surface, the innermost pair with dense sericeous indumentum on outer surface, the inner surfaces of all sepals glabrous; petals 4, broadly ovate, 12–15 mm long, 12–15 mm wide, with apex rounded and entire; stamens numerous (c. 150), multiseriate, with filaments 5–8 mm long, free, glabrous but surrounded at the base by short hairy scales which cause the filaments to adhere and be shed en masse; anthers globular, 0.3–0.5 mm long, 0.3–0.5 mm wide, biloculate, longitudinally dehiscent, dorsifixed and versatile; ovary ovoid to ovoid-ellipsoid, 2–3.5 mm long, 1.5–3 mm wide, 7–9-locular, with densely appressed tomentose indumentum; styles 7–9, 1.5–3 mm long, glabrous. Capsule 7–9-locular, somewhat woody, c. 10 mm long, 7–8 mm diameter, septically 7–9-valved; each valve glabrous and flat on the sides and villous on the back. Seeds lacrimiform in outline, c. 3.5 mm long and 1.5 mm wide, narrowly winged at the broad end, dark shiny brown. **Fig. 1.**

**Additional specimens examined:** Queensland. COOK DISTRICT: Mt Bartle Frere, Mar 1980, *Godwin* C1158 (QRS); Upper Eastern Bartle Frere, Nov 1986, *Godwin* C2956 (BRI, QRS); ditto, Dec 1986, *Godwin* C2959 & *Stanton* (BRI, QRS).

**Distribution and habitat:** *Eucryphia wilkiei* is known only from the eastern summit area of Mt Bartle Frere in north-east Queensland (**Map 1**) where it occurs from 1200–1400 m altitude in microphyll vine thicket amongst large granite boulders.

**Notes:** *Eucryphia wilkiei* is notable for being the only tropical species of the genus. It has a similar habit to the species from southern Australia but differs from all of these in numerous ways (**Table 1**). The closest apparent relatives to *E. wilkiei* on morphological grounds appear to be *E. jinksii* and *E. moorei*.

**Conservation status:** *Eucryphia wilkiei* is known only from the type locality on the eastern side of Mt Bartle Frere. This locality is wholly within National Park but is subject to irregular damage from cyclones and storms. A conservation coding of 'V' (Vulnerable) has been previously allocated to the species under the Queensland *Nature Conservation Act 1992* (Jessup 1994).



**Fig. 1.** *Eucryphia wilkiei*. A. flowering twig  $\times 1$ . B. group of stamens  $\times 6$ . C. group of hairy scales at base of stamen  $\times 12$ . D. abaxial view of anther  $\times 20$ . E. adaxial view of anther  $\times 20$ . F. lateral view of anther  $\times 20$ . G. dehiscent fruit  $\times 3$ . H. seed  $\times 5$ . All from Wilkie s.n. (QRS). Del. T.J.Hyland.

**Etymology:** Named in honour of John (Jack) Henry Wilkie (1902–x), an expert orchidologist and explorer of the Bellenden Ker–Bartle Frere mountain range. Jack discovered and made the first herbarium collections of *E. wilkiei*.

**Eucryphia jinksii** P.I.Forst., **sp.nov.** affinis *E. wilkiei* B.Hyland autem statura grandi, arbore ad 25 m alta, stipulis multo grandioribus (12–15 mm vix 4–5.5 mm longis), petiolis longioribus (5–15 mm vix 0.3–5 mm longis), foliis marginibus planis et venis lateralibus pluribus principalibus (22–30 vix 12–20) praeditis differt. **Typus:** Queensland. MORETON DISTRICT: Natural Arch National Park 752, McPherson Range, 5 Mar 1995, P.I.Forster PIF16391, D.Jinks & G.Leiper (holo: BRI [3 sheets + spirit]; iso: AD, CANB, HO, K, L, MEL, NSW, NY, QRS, WELT distribuendi).

Tree to 25 m tall, often multistemmed; indumentum of simple yellow to yellow-ginger-coloured hairs. Bark nondescript, pale brown, sometimes slightly lenticellate; blaze pale pink with faint pumpkin-like scent, wood straw-coloured. Twigs villous, glabrescent, never resinous. Stipules lanceolate, acuminate at the apex, 12–15 mm long, 1.5–2 mm wide, connate, caducous, with dense indumentum on margins. Leaves opposite, simple, bifoliate or trifoliate, new growth bright pink; petioles 5–15 mm long, 0.7–1 mm wide, villous, soon glabrescent; lamina/leaflets elliptic-oblong to lanceolate-oblong, 25–100 mm long, 8–28 mm wide, sericeous when young becoming glabrescent on both surfaces; margins  $\pm$  flat; midrib slightly raised on the upper surface; main lateral veins 22–30 pairs at an angle of 45–50° to the midrib, distinct on the glaucous underside but less so on the dark glossy green upper surface; base cuneate to attenuate; apex acute to acuminate. Flowers axillary; peduncles 2–3 mm long, with dense indumentum; bracts 4 or 5, imbricate, orbicular or ovate, 3–4 mm long, 2–3 mm wide, ciliate on margins, sericeous on both the inner and outer surfaces, outermost pair of bracts persisting to the early fruiting stage and more densely pubescent on the keel area, brown; pedicels short at bud stage but elongating to 4–5 mm long at anthesis and 10–13 mm long at the fruiting

stage,  $\pm$  glabrescent at fruiting stage; sepals 4, imbricate, decussate, lanceolate, 9–10 mm long, 4–5 mm wide, the outermost and innermost pairs with dense sericeous indumentum on outer surface, the inner surface of outermost pair with dense sericeous indumentum near apex, the inner surface of innermost pair glabrous; petals 4, obovate, 15–17 mm long, 14–15 mm wide, with apex rounded and entire; stamens numerous (130–140), multiseriate, filaments 8–11 mm long, free, glabrous but surrounded at the base by short hairy scales which cause the filaments to adhere and be shed *en masse*; anthers globular, 0.5–0.8 mm long, 0.5–0.8 mm wide, biloculate, longitudinally dehiscent, dorsifixed and versatile; ovary ovoid to ovoid-ellipsoid, 3.5–5 mm long, 3.5–4 mm wide, 6–9-locular, with densely adpressed tomentose indumentum; styles 6–9, 2–2.5 mm long, glabrous. Capsule 6–9-locular, somewhat woody, 11–13 mm long, 8–9 mm diameter, septicidally 6–9-valved; each valve glabrous and flat on the sides and sparsely villous on the back. Seeds lacrimiform in outline, 4–5 mm long, 1.5–2 mm wide, narrowly winged at the broad end, pale brown. **Fig. 2.**

**Additional specimens examined:** Queensland. MORETON DISTRICT: near Natural Arch N.P., Nov 1994, *Jinks* [AQ632334] (BRI).

**Distribution and habitat:** *Eucryphia jinksii* is restricted to south-east Queensland where it occurs near Springbrook in the McPherson Range (**Map 1**). The single known population occurs at an altitude of 770–800 m in complex notophyll vine forest on rhyolite.

**Notes:** *Eucryphia jinksii* appears to be more closely related to *E. wilkiei* rather than the other southern Australian species (**Table 1**), particularly because of the similar appearance of the foliage. *E. jinksii* differs most noticeably from *E. wilkiei* in being a large tree to 25 m tall, with much larger stipules (12–15 mm long as opposed to 4–5.5 mm long), longer petioles (5–15 mm long as opposed to 0.3–5 mm long), leaflets with flat margins, and a greater number of lateral vein pairs in the leaflets (22–30 as opposed to 12–20).

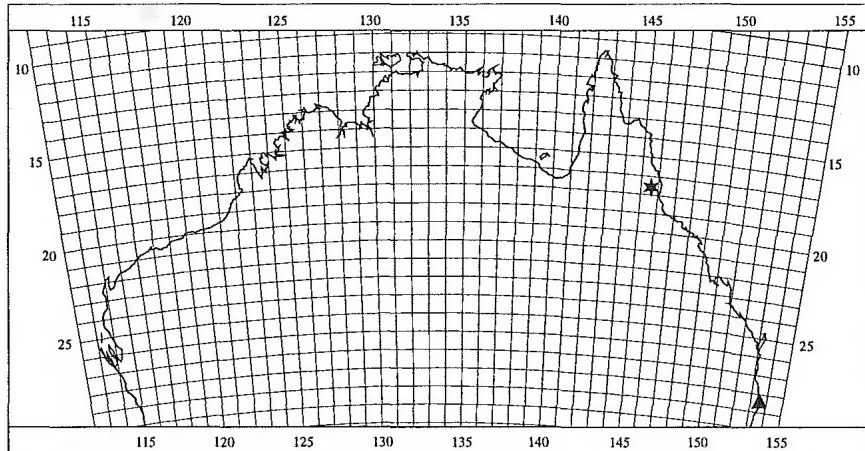
**Conservation status:** The single known population of *E. jinksii* comprises several hundred mature individuals over an area of c. 2

ha concentrated in a narrow band along a steep rocky watercourse. Despite the copious fruit set observed at the time of collection of the type, there was no evidence of recent past seedling recruitment. Nearly all of the individuals occur within Natural Arch National Park (now Springbrook National Park), but a few are present on adjacent private land.

There are no immediate threats to this species; however, it has a restricted area of occurrence and is unlikely to be more widespread as the Springbrook area is relatively well-

explored. The species is susceptible to damage from changes in catchment structure which could occur if future development of the private land in the water catchment above the population proceeds. A conservation coding of 'E' (Endangered) is suggested for listing under the Queensland *Nature Conservation Act 1992*.

**Etymology:** Named in honour of David Jinks of Springbrook who discovered this species, recognised its significance, and whose tree-climbing prowess enabled the type to be collected.



Map 1. Distribution of *Eucryphia jinksii* ▲ and *E. wilkiei* ★.

**Key to the Australian species of *Eucryphia***

- 1. Twigs and buds resinous; leaves always simple ..... 2  
 Twigs and buds not resinous; leaves sometimes simple, but generally bifoliate, or imparipinnate with 3–13 leaflets ..... 3
- 2. Stipules ovate; leaves 2.5–4.5 cm long with 14–16 lateral vein pairs ..... ***E. lucida*** (Labill.) Baill.  
 Stipules lanceolate; leaves 1–2 cm long with 7–9 lateral vein pairs ... ***E. milliganii*** Hook.f.
- 3. Leaflets with 12–20 lateral vein pairs and recurved margins ..... ***E. wilkiei*** B.Hyland  
 Leaflets with 22–30 lateral vein pairs and flat margins ..... 4
- 4. Stipules lanceolate, 12–15 mm long; leaflets 1–3, tips acute to acuminate ..... ***E. jinksii*** P.I.Forst.  
 Stipules ovate, 2.5–3 mm long; leaflets (1,2)3–13, tips mucronate ..... ***E. moorei*** F.Muell.

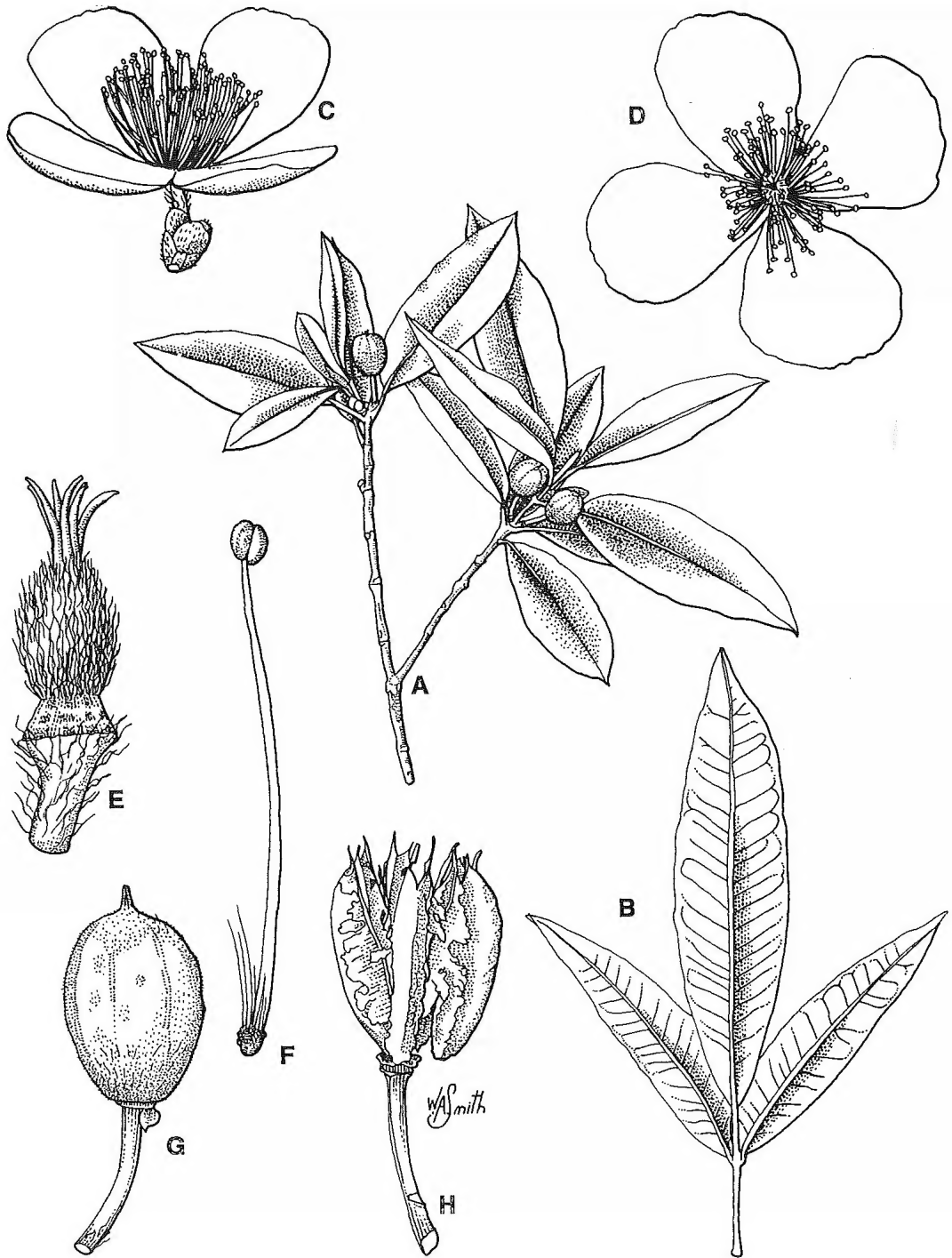
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T.J.Hyland prepared **Fig. 1**. W.Smith (BRI) prepared **Fig. 2**. Y.Smith (BRI) prepared **Map 1**. L.Pedley (BRI) kindly provided the translations of the diagnoses into Latin.

**Table 1. Comparison of diagnostic features of Australian species of *Eucryphia***

Character state	<i>E. jinksii</i>	<i>E. lucida</i>	<i>E. milliganii</i>	<i>E. moorei</i>	<i>E. wilkiei</i>
Twigs & buds resinous	no	yes	yes	no	no
Stipule shape	lanceolate	ovate	lanceolate	ovate	lanceolate
Stipule length (mm)	12–15	2.5–4	3–5	2.5–3	4–5.5
Leaf arrangement simple (1) bifoliate (2) imparipinnate (3–13 leaflets)	1,2,3	1	1	(1,2)3–13	1,2,3(5)
Petiole length (mm)	5–15	2–6	1–3	3–17	0.3–5
No. lateral vein pairs in leaf/leaflet lamina	22–30	14–16	7–9	22–25	12–20
Leaflet margins flat (–) or recurved (+)	–	+	+	–	+
Leaflet shape elliptic-lanceolate (1) elliptic-oblong (2) elliptic-ovate (3) lanceolate-oblong (4)	1,2,4	1,2,3	2,3	1,2,3	2,3,4
Leaflet length (mm)	25–100	15–45	6–20	9–65	25–100
Leaflet tip shape	acute acuminate	retuse rounded	retuse rounded	mucronate	acute mucronate
Pedicle length (mm)	4–13	5–10	6–10	10–15	6–15
Petal width (mm)	14–15	10–18	7–11	11–13	12–15



**Fig. 2.** *Eucryphia jinksii*. A. fruiting twig  $\times 0.5$ . B. trifoliolate leaf  $\times 0.8$ . C. lateral view of flower  $\times 1.5$ . D. apical view of flower  $\times 1.5$ . E. lateral view of flower with perianth and stamens removed  $\times 4$ . F. stamen  $\times 8$ . G. lateral view of fruit  $\times 2$ . H. dehiscent fruit  $\times 2$ . All from Forster 16391 *et al.* (BRI). Del. W. Smith.

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